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ABSTRACT

A study examined three aspects of the collective bargaining situation that involves, either directly or indirectly, communication behavior: (1) the number of opportunities to communicate, (2) the degree of cooperation/competitiveness shown by an opponent, and (3) the degree of communication apprehension possessed by parties to the process. Seventy-two college students participated in the study. Each was administered a measure of communication apprehension and then asked to play the "prisoner's dilemma game," which is designed to measure the degree of a subject's cooperation/competitiveness. The results showed that a higher number of communications between game participants and their partners was related with more cooperative behavior. In addition, the findings revealed that, generally, persons who are anxious about communication with others tend to be more cooperative in their behaviors in a bargaining situation in order to avoid conflict. (FL)

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The Effects of Communication Apprehension and Opportunity to Communicate on Human Bargaining Behavior

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The Effects of Communication Apprehension and Opportunity to Communicate on Human Bargaining Behavior

The study of human bargaining behavior has generated considerable research in recent years, much of which has been summarized in Schelling (1960), Walton and McKersie (1965), Rubin and Brown (1975), Tedeschi, et al. (1973) and Druckman (1977). A certain amount of this research has been concerned with the effects of various communication variables on bargaining behavior (Tedeschi and Rosenfeld, 1980). The present study examines three aspects of the bargaining situation which involve, either directly or indirectly, communication behavior: the number of opportunities to communicate, the degree of cooperation/competitiveness shown by an opponent, and the degree of communication apprehension possessed by subjects.

Opportunity to Communicate

Tedeschi and Rosenfeld (1980) have observed that "communications serve critical functions in bargaining" (p. 246). Many researchers have found a direct relationship between the effectiveness of bargaining behavior and the extent to which parties communicate with each other (Bixenstine and Douglas, 1967; Terhune, 1968; Voissem and Sistrunk, 1971; Cole, 1972). One of the paradigms frequently used to examine such communication involves making communication possible only at certain times. Such approaches have been described as "frequently integral parts of the research design used to study bargaining behavior (Rubin and

Brown, 1975, p. 116). Terhune (1978), for instance, utilized a two-person 30 trial prisoner's dilemma game in which the two persons were able to freely communicate (in writing) with each other during trials. Such pairs tended to be more cooperative than pairs who were not allowed such communication. Bixenstine and Douglas (1967) found in 6-person prisoner's dilemma games that when subjects were given 15-20 minute verbal communication opportunities during a recess in the game, the subjects tended to be more cooperative than if not given such a chance to communicate. Although there is research which suggests that the presence of communication in a bargaining situation leads to more cooperation than does a complete absence of communication (Loomis, 1959; Radlow and Weidner, 1966), the authors were unable to discover any published research which studied the effects of various amounts of communication upon cooperation/competitiveness in bargaining. Given the conclusions of existing research, it is hypothesized that:

H_1 The amount of communication is negatively related to competitiveness in bargaining.

Cooperativeness/Competitiveness of Opponent

Rubin and Brown have concluded that, in bargaining, "cooperation begets cooperation; and, conversely, noncooperation begets noncooperation" (p. 270). Although there is a modest amount of research which would contradict this (such as that conducted by Gahagan and Tedeschi, 1968 and Lindskold and Tedeschi, 1971), the great majority of studies done in this area supports the observation that, when playing against a simulated other in a bargaining

situation, the level of cooperation of subjects tends to reflect the cooperation evidenced by the opponent. Current research in this area has not been plentiful--the most recent research was performed in the Sixties and early Seventies (as in the following, all of which support Rubin and Brown's conclusion: Gahagan, Long and Horai, 1969; Gruder and Duslak, 1973; Lave, 1965 and Wyer, 1971). All of the above-mentioned research utilized prisoner's dilemma games similar to the one utilized in this study. In each case the games were designed for two people, with one person's responses being artificially cooperative or noncooperative. In many cases the responses were simulated for the subject participating in the study. In order to provide a more recent test of the relationship between opponents' cooperation and Ss' cooperation, we hypothesize that:

H_2 The level of cooperation evidenced by simulated opponents in bargaining is negatively related to the level of competitiveness shown by subjects.

Effects of Communication Apprehension

Several personality characteristics have been shown to have an influence on an individual's bargaining behavior, such as risk-taking propensity (Dolbear and Lave, 1966; Sherman, 1967; and Harnett, Cummings and Hughes, 1968), perceived locus of control (Rotter, 1966; Condry, 1967), authoritarianism (Hermann and Kogen, 1977; Smith, 1967), and machiavellianism (O'Brien, 1970; Uejio and Wrightsman, 1967, and Wahlin, 1967). As far as a diligent search by the authors has been able to determine, however, no

published research exists which examines the role of communication apprehension in bargaining behavior. Although, strictly speaking, communication apprehension may not itself be a personality trait, it has been linked to several personality traits, including several listed above (McCroskey, et al., 1976). Given the vast amount of literature which the study of communication apprehension has generated (McCroskey, 1977), the authors felt this lapse to be unusual. Since the typical "high communication apprehensive" person is likely to be, among other things, "a follower, submissive, conforming and obedient," (McCroskey, et al., p. 378), the authors hypothesized that:

H_3 The degree of communication apprehension reported by an individual is negatively related to competitiveness in bargaining.

In addition, in order to allow for full analysis of the effect, if any, of communication apprehension on bargaining, we posited the following research questions:

1. Is there a significant interaction between communication apprehension and the number of communications permitted in bargaining such that the relationship between communication apprehension and cooperation will differ across the number of communications?

2. Is there a significant interaction between communication apprehension and the cooperative-competitive condition such that the relationship between communication apprehension and cooperation will be different in the cooperative condition than in the competitive condition?

METHOD

Instruments

Game Paradigm. The paradigm used for the bargaining situation in this study was the non-zero sum prisoner's dilemma game (Rubin and Brown, 1975). The game consists of two players who choose a particular color for each trial of the game. In this study, the subjects individually played against a confederate and each chose either red or black for each of twenty-one total trials. The results of each trial was revealed before the next trial was started. Subjects would receive points as follows: if both players chose black, both received one point; if both players chose red, both received negative one point; if one chose red and the other black, the player choosing black received negative two points and the player choosing red received plus two points. Therefore, a red choice was considered competitive since points could be gained only at the expense of the other player; and a black choice was considered cooperative since points could be gained only with cooperation from the other player. The confederate was played by the experimenters.

Dependent Variable. The dependent variable was a measure of each subject's competitiveness as assessed by the number of red choices made during the game. Thus choosing 13 reds in 21 trials would be scored as 13.

Communicative Messages. As will be explained below, one of the variables assessed was the number of communications during the game. It was necessary to generate appropriate messages for

the subjects to send to the confederate and vice versa. It was decided to use written messages from which the subjects could make choices in order to have the maximum control over the communication between players. The authors generated eight cooperative messages and eight competitive messages and two neutral messages which were then rated by five communication graduate students. The top five cooperative messages and the top five competitive messages were selected, along with the two neutral ones. Appendix A gives the results of these ratings.

Communication Apprehension. Communication Apprehension was assessed by use of the PRCA for college developed by McCroskey (1970).

Independent Variables

Each of the following independent variables were used as a result of the three hypotheses given earlier. The Research questions were asked to insure a full investigation of the effect of communication apprehension in the assessment of the data collected.

Number of Communications. Each subject was in one of three possible communicative conditions. The first involved no communication between players during the prisoner's dilemma game. The second involved one communication after the tenth trial. The third condition involved three communications after the sixth, eleventh, and sixteenth trials. For each communication, the subjects would choose one of the twelve messages discussed above (and found in Appendix A) to be sent to the confederate, and then the confederate would respond with one of the messages. In the competitive condition, the confederate always returned a competi-

tive message; likewise in the cooperative condition the confederate always gave a cooperative message in return.

Bargaining Condition. Each subject was in one of two possible bargaining situations. The first was labeled cooperative and was one in which the confederate responded with 18 black choices and 3 red choices (trials 5, 9, 16). The second was labeled the competitive condition and was one in which the confederate responded with 18 red choices and 3 black choices (trials 5, 9, 16).

These first two independent variables represent a total of six possible combinations for any particular subject to receive. These six combinations were randomly put into a block of six and then assigned to the subjects in the order they participated.

Communication Apprehension. Each subject completed the PRCA. This is not a true experimental variable since the subjects were not randomly assigned (and could not be) to various levels of communication apprehension. However, it is possible to examine the effect of this variable within an experimental approach.

Outline of Procedure

Subjects. A total of 72 subjects were analyzed out of 74 participating undergraduate students enrolled in speech courses at a midwestern university. Such participation is required in the speech courses at this university. Two subjects were eliminated from the study because the debriefing indicated that their color selection was made on a random basis.

Experiment. Each subject followed this format: first, the subject was asked to fill out the PRCA. Then one experimenter read instructions concerning the nature of playing the prisoner's dilemma game. The other experimenter was in an adjoining room serving as the confederate. The subject was then assigned to one of the six conditions. After answering questions concerning the nature of the game, the experimenter started the game. The subject had 30 seconds to choose each color at the start of each trial. In conditions requiring communications, the subject was given up to two minutes to choose one of the twelve pre-written messages. The experimenter would go from room to room to report the choices made for each trial, and to deliver the messages exchanged between the players. A score sheet was kept by the experimenter to record color choices and message choices as well as the score of the game. After completion of the experiment, the subject was debriefed.

RESULTS

Instrument Reliability. The reliability of the PRCA was assessed by use of the alpha statistic and was found to be .93. The reliability of the dependent variable, competitiveness, was assessed using the KR-20 statistic (an alpha statistic for dichotomous measures) and was found to be .83. Both reliabilities were considered acceptable.

Analysis of Variance Results. A three-way ANOVA design was used to assess the results of the experiment. The three independent variables served as the factors, thus making a 2 x 2 x 3

design (communication apprehension was analyzed using a regression approach utilizing one vector in the regression equation, equivalent to a two-level design). Table One gives the results of the ANOVA. These results will be discussed in terms of the hypotheses and research questions.

Hypothesis one was confirmed as the number of communications was a significant effect. The means are: for no communication--14.58, for one communication--13.67, and for three communications--11.96. This indicates that as the number of communications increases, the competitiveness of the responses by the subjects decreases.

Hypothesis two was confirmed as the bargaining situation was a significant effect. The means are: for the competitive condition--16.06, and for the cooperative condition--10.75. This indicates that the subjects responded more competitively in the competitive bargaining situation than in the cooperative bargaining situation.

Hypothesis three was not supported.

The first research question, an interaction between communication apprehension and the number of communications, did not receive any significant results.

The second research question, an interaction between communication apprehension and the bargaining situation, was significant. One appropriate interpretation of this result is that the correlation between communication apprehension and competitiveness (D.V.) differs between the two bargaining situations. Table Two gives these correlations. One immediate observation is that the

Table One

Analysis of Variance Results

	SS	df	MS	F	P
No. of Communications	86.643	2	43.321	3.45	$<.05$
Bargaining Situation	496.760	1	496.760	39.60	$<.001$
Communication Apprehension	3.414	1	3.414	.27	n.s.
No. of Comm. x Barg. Sit.	75.425	2	37.712	3.01	n.s.
No. of Comm. x Comm. App.	11.438	2	5.719	.46	n.s.
Barg. Sit. x Comm. App.	55.334	1	55.334	4.41	$<.05$
Three Way Interaction	91.394	2	45.697	3.64	$<.05$
Error	752.613	60	12.544		
Total	1573.319	71			

Table Two

Correlations of Communication Apprehension with Competitiveness in Each Bargaining Situation

	Cooperative Situation	Competitive Situation	
Correlations	.05	-.18	N=36

correlation is positive in the cooperative situation but negative in the competitive situation. However, no conceptual interpretation should be made without first investigating the significant three-way interaction.

The three-way interaction would seem to present some interpretational problems, as higher interactions tend to do. One appropriate way to view the interaction is to look at the correlations between communication apprehension and competitiveness (D.V.) for all six cells representing the combination of the three communications levels and two bargaining situations. Table Three gives these correlations. It can be readily seen that the

Table Three

Correlations of Communication Apprehension with Competitiveness in Each Bargaining Situation Within Each of the No. of Communication Conditions

	Cooperative Situation	Competitive Situation	
0 Communications	-.26	-.35	
1 Communication	-.42	-.04	
3 Communications	.65	-.28	N=12

interaction occurred because of the cooperative-three communications cell having the only positive (and largest) correlation; as all other cells have negative correlations. Also, this fact clearly points out the reason for the significant two-way interaction, as the appropriate average of the correlations for each bargaining situation would give the results in Table Two. Therefore, the two-way interaction has no conceptual meaning, but the three-way interaction can be conceptually interpreted.

The negative correlations in five of the six cells of the three-way interaction can be interpreted as follows: the more communication apprehension a subject reports, the less competitive he responds in the prisoner's dilemma game. This supports the third hypothesis. The positive correlation in the cooperative-three communications cell indicates that the more communication apprehension a subject reports, the more competitive he plays the game. Thus the results indicate either the one cell has a meaningful nonintuitive interpretation; or, if it is to be viewed as a sampling error, then the other five cells would indicate the true nature of the effect of communication apprehension, which is that the higher communication apprehension a subject has leads to lower competitive behavior in bargaining situations.

DISCUSSION

This section is divided into two parts, the first which will discuss the results of the hypotheses and research questions, and the second will discuss future research in the area of bargaining.

Interpretation of Results. The first two hypotheses were important because of their value in determining the validity of the study as a bargaining situation. Research has indicated that both the number of communications and the type of bargaining situation are important variables in bargaining. This study found such results in the first two hypotheses, and also confirmed the direction in which the variables were predicted to occur. That is, the higher number of communications was related with more cooperative behavior; and the cooperative situation had more

cooperative behavior than the competitive situation. Any study which purports to relate communication variables to other salient variables in a bargaining situation (as this one does) must demonstrate to some degree that a bargaining situation existed. The results of this study in terms of communication apprehension can now be appropriately discussed pertinent to a bargaining situation.

The third hypothesis suggested that there would be a relationship between communication apprehension and competitiveness such that the person reporting higher communication apprehension would respond more cooperatively in the bargaining situation. Initially this hypothesis had to be unsupported based upon the analysis of variance results. However, upon analysis of the interaction effect (research questions) it was found that communication apprehension had a significant interaction effect with the other variables of the study. Post hoc analysis revealed that the subjects in one of the possible six cells relating the number of communications to the type of bargaining situation responded differently in competitiveness in relation to communication apprehension than the other five cells. The five cells supported the third hypothesis, thus supporting the intuitive notion that persons who are anxious over communication with others would tend to want to be more cooperative in their behaviors in a bargaining situation to possibly avoid conflict or anticipated future communications. The interpretation of the sixth cell becomes troublesome, because it suggests just the opposite, that people with anxiety to communications would increase their

competitive behaviors. Two possible reasons can be given for this result. The first is that perhaps due to the size of the sample (n=12 per cell) the results are due to some sort of sampling error or subject bias. If this is the case, then the authors argue that the other five cells are representative of the population and support the third hypothesis. The second reason is that the effect is real, and that an interaction can be conceptually valid in relating communication apprehension to other variables in a bargaining situation. The results, in this case, would suggest there is at least one bargaining situation (in this study, the situation was a cooperative situation with three opportunities for communication) in which a more communicative apprehensive person would tend to be more competitive. This result would be important in that it may suggest that certain bargaining situations may be useful in helping a more anxious communicator to become more competitive. Whether to be more competitive is desirable or not is not the concern of this study. That there are kinds of situations which may help anxious communicators to want to communicate in a more anxious-free situation is important, and should perhaps be pursued.

Future Research. Rubin and Brown (1975) have a very good collection of many of the salient variables which affect various bargaining situations. Most of these variables can be seen as personality variables or situational variables but not necessarily as communication variables. Questions may be asked such as: What is the nature of the relationship between participants in a bargaining situation which allow these salient variables to be known

and/or have an effect upon that situation? This question may be best answered by looking at communication variables. This study looks at one such variable, which is the anxiety a person may have in communicating in particular ways in the situation. This study indicates that by looking at such variables, then the nature of the bargaining situation may become more apparent, and hence the effects of the salient variables as mentioned by Rubin and Brown (1975) can be assessed more adequately. It is posited that perhaps the communication variables can be viewed as mediating variables between the personality variables and the behaviors displayed within a bargaining situation. This study suggests that the behavior displayed by persors in a bargaining situation can differ in differing bargaining situations as the effect of a communication variable--communication apprehension. It is suggested that further research utilizing communication variables in bargaining situations may produce fruitful results for those scholars who have an interest in the effects and behaviors present in bargaining situations. For example, the personality variables discussed by Rubin and Brown (1975) could be evaluated in bargaining situations along with a mediating communication variable such as self-disclosure. Certainly the degree and type of self-disclosures made in a bargaining situation would affect the way in which perceived personality variables affect human bargaining behavior. However, research in bargaining does not address this affect, but singly relates a set of personality variables with outcomes in bargaining situations. By investigating communication variables, such as self-disclosure and communication apprehension,

an interactive process analysis can be made of bargaining situations which would add to existing knowledge which relate personality variables to outcome variables in bargaining situations.

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APPENDIX A

Rating of Messages

Message	Rating*
1. I think I can do better if I do this by myself.	2.4
2. The way I see this game, it's everyone for himself.	1.0**
3. I'll give a little if you give a little.	6.2**
4. We're only going to get somewhere with this game if we get together.	7.0**
5. We can both earn points if we agree to make the right choices.	6.4**
6. Can't help you. Sorry.	2.0**
7. If we both play black we both win. What do you say?	6.4**
8. I'm in this for myself.	1.0**
9. I see no point in cooperating.	1.0**
10. Let's help each other.	6.2**
11. I think we should both try to reach an agreement on choice of colors.	5.8
12. I agree with you.	5.6
13. I will not give you any guarantees about my choices.	2.6
14. Competition is what this game is all about.	1.2**
15. No message tc send.	4.0***
16. No message in reply.	3.8***
17. We should reach some sort of agreement on our choices.	5.4
18. I disagree with you.	3.0

*Mean rating with 1 = most competitive and 7= most cooperative.

**Messages selected for use in the game.

***Messages authors intended to include, and did. Ratings were taken to verify their neutrality.